



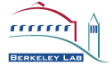
Muon chambers

neutrino.lbl.gov/~snoman/currat/talks/

Charles Currat
LBNL

August 6, 2004
SNO coll. meeting, Sudbury

❖ Towards muon chambers for SNO

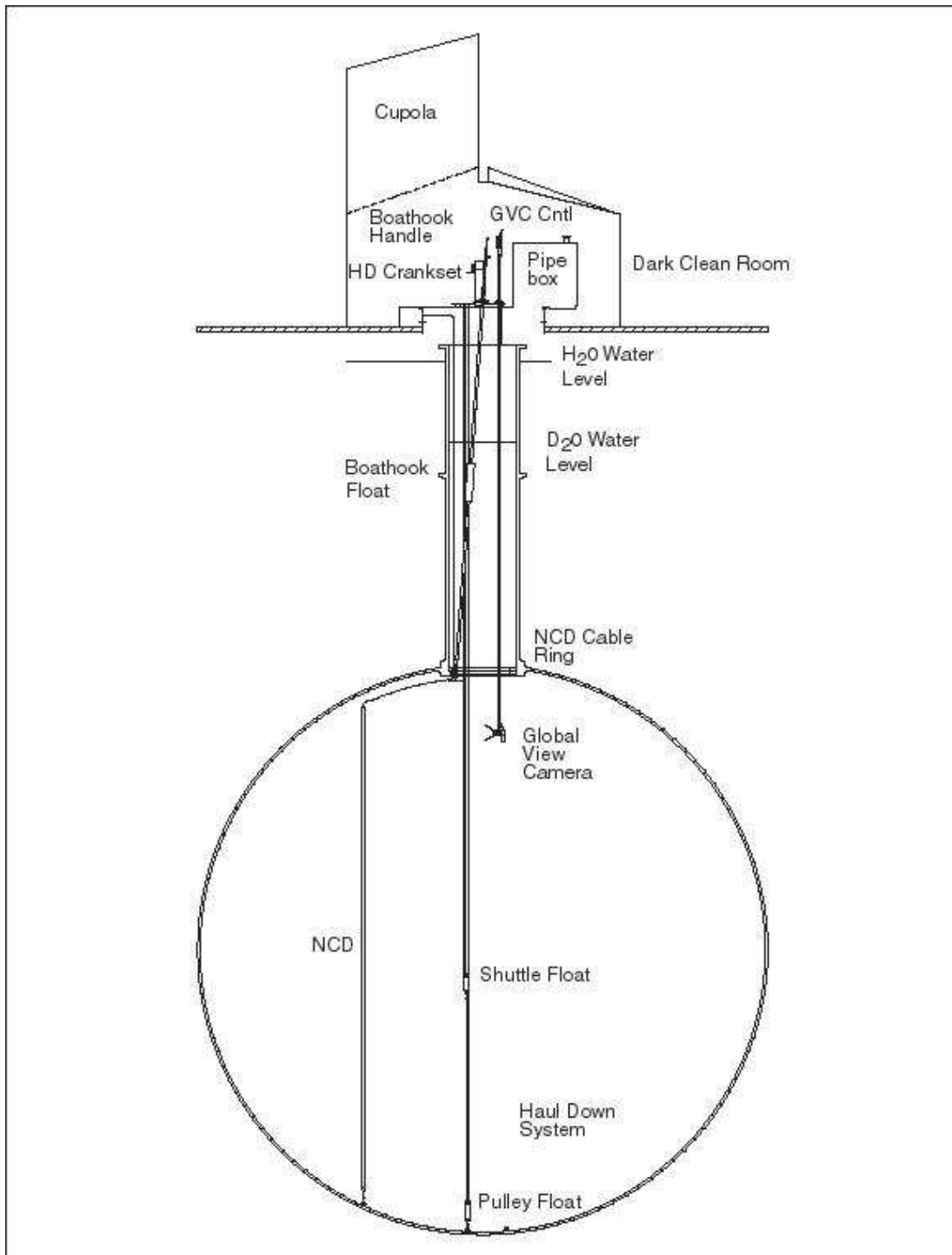


Motivation

- ☞ Provide calibration for muons in SNO.
 - ◆ As now the muon data uses a fitter that relies on a MC that relies on data (in principle not the same chunk)
 - ◆ Will allow to tune the muon simulation and reconstruction algorithm (FTM) with independent data
 - ◆ In particular, clipping muons $\rho \gtrsim 750$ cm
 - ◆ Rate measurements (SNOlab)

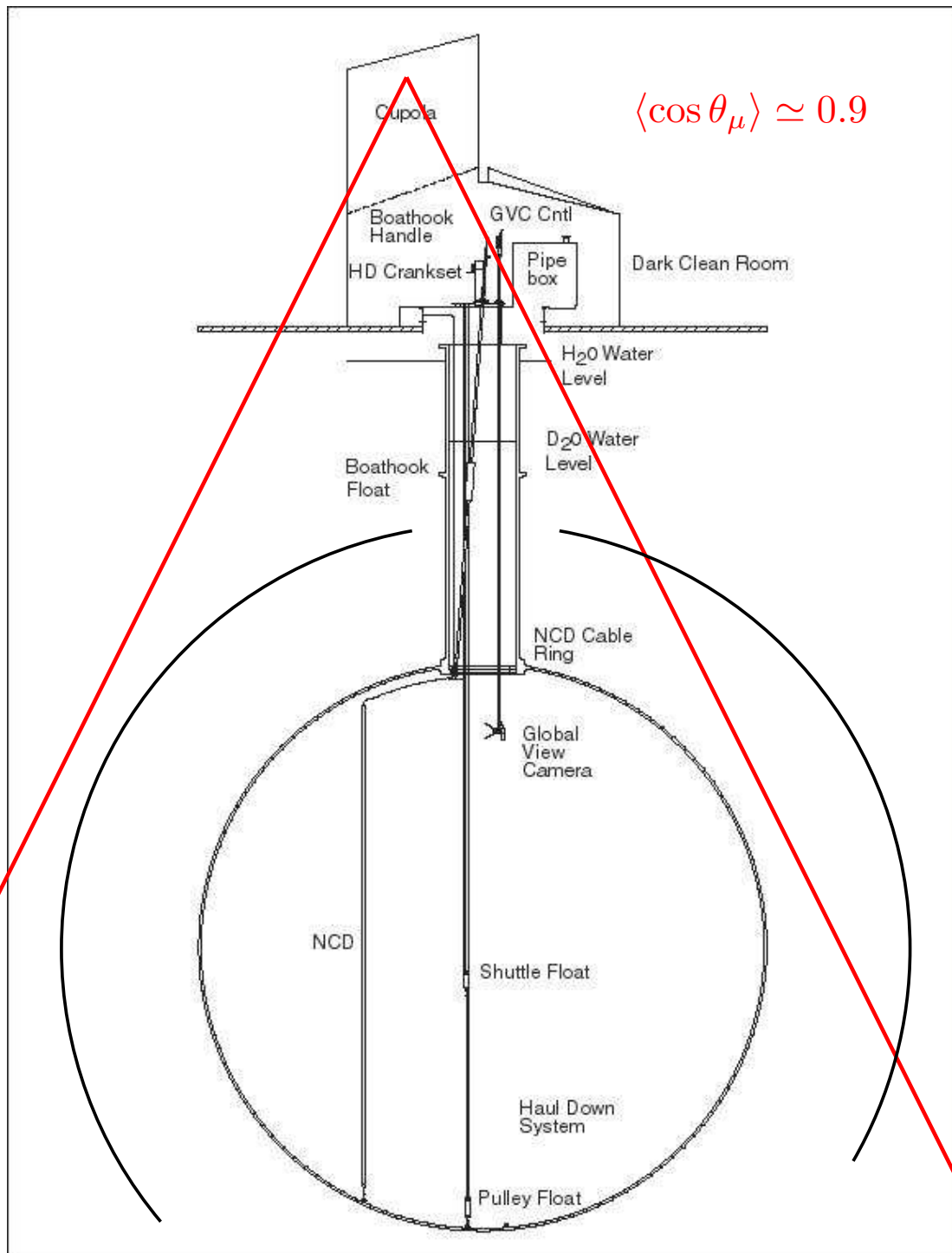


Location





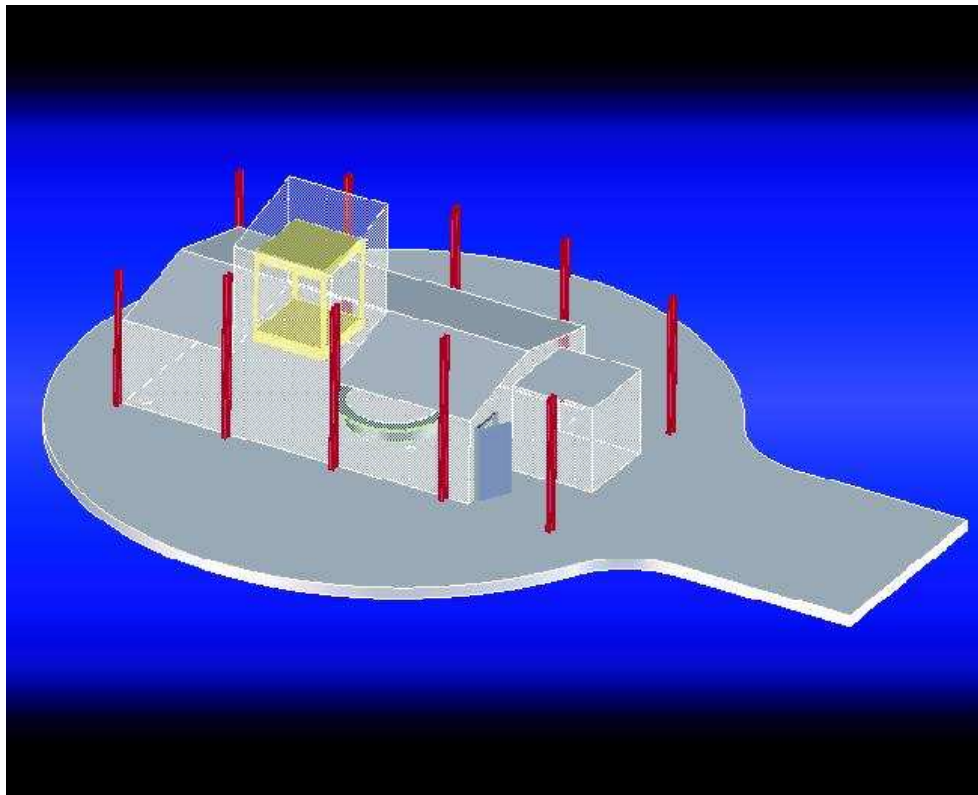
Location



The candidates

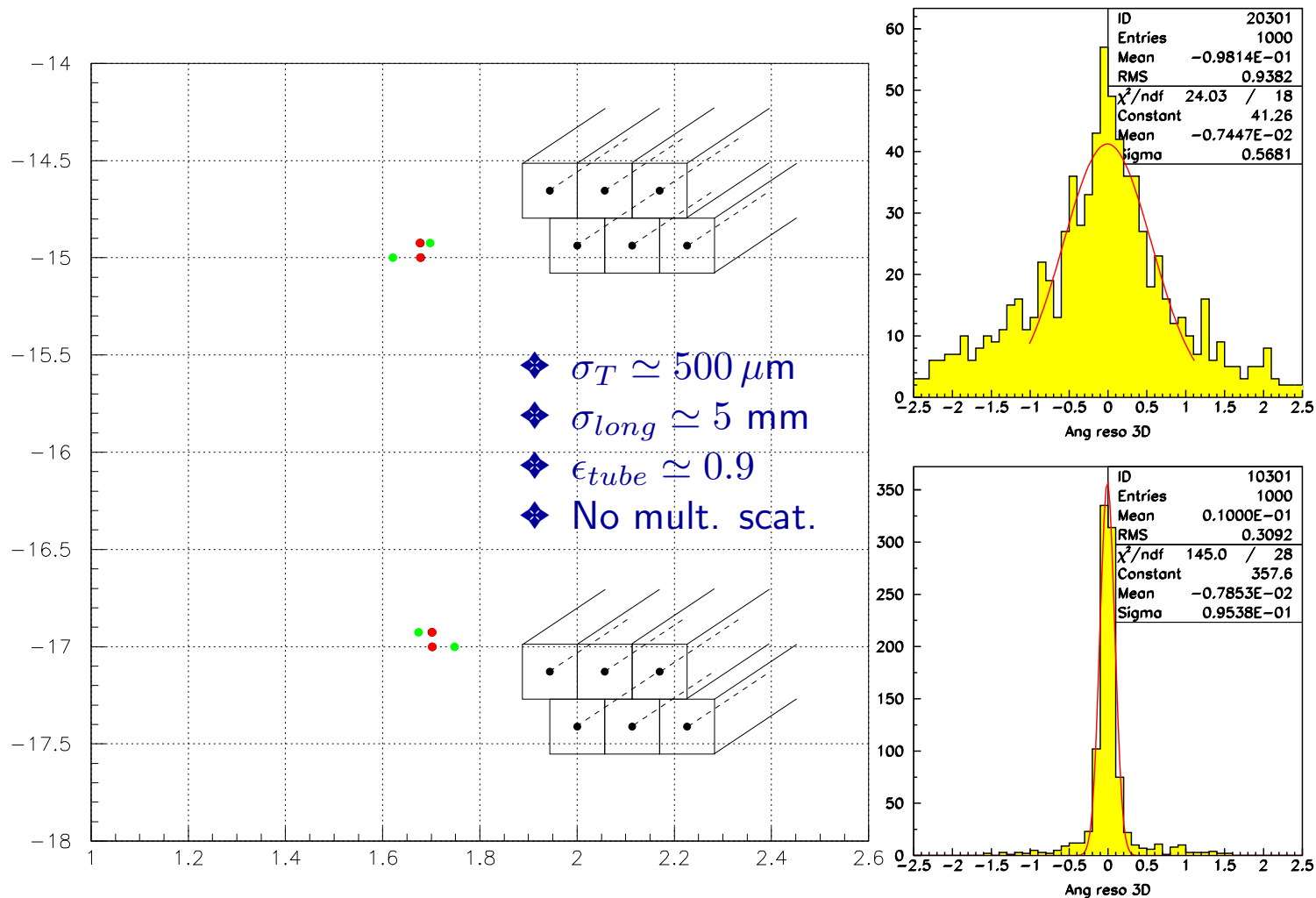
- ❖ 8 chambers $101'' \times 50'' \times 3''$, weighing about 150–200 lbs a piece. Made of drift tubes $3'' \times 3''$ in cross section (so 16 channel/chamber).
- ❖ The chambers arrived in Berkeley on August 4th.





- ❖ Strawman design is 2 stations of 2 XY layers each about 2 m apart (to be studied). 1 station consists in 2 chambers side by side covering $2.5 \times 2.5 \text{ m}^2$ (plus 1 plane of scintillator pads).
- ❖ The cupola is approximately 3 m x 3 m, so could house the tracker.
- ❖ The tracker will need to be elevated ➡ **support structure** to be designed, cage-like (Unistruts)
- ❖ Blue beam above DCR can provide (partial) support
➡ what load, what clearance?

A **toy simulation** of the chambers has been developed. Allows to study the performance of the tracker in different configurations at leisure.





Proposal



The muon tracker installation/operation should not interfere with normal SNO detector operations (or ALARA).

- ❖ Aim for 1 week installation/cabling work on deck at most
- ❖ μ DAQ can be standalone: we would provide electronics, computer and storage
 - ➡ Will need a clock to be in sync with SNO
- ❖ The tracker data can be merged offline by hand to the SNO zdab (2-3 muons a day + noise)
- ❖ Will need to bring gas bottles on deck. Mixture will in principle be ArCO₂.



Temptative project schedule

- ❖ QA operations at LBNL → cosmic test stand
- ❖ DAQ software development
- ❖ Engineering: scintillator pads for trigger, support
- ❖ Proposal to be prepared within Muon Working Group

